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ABSTRACT

This document presents the application and use of mathematics learning proposed by the Arkansas curriculum frameworks for grades K-4. The standards are presented in chart form and organized into five strands: (1) number sense, properties, and operations; (2) geometry and spatial sense; (3) measurement; (4) data analysis, statistics, and probability; and (5) patterns, algebra, and functions. Student learning expectations for each of the content standards are also provided. (KHR)

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SAMPLE GRADE LEVEL BENCHMARKS

GRADES K-4

based on the 1998 Arkansas State Mathematics Framework
Arkansas Department of Education, 1998

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THIS DOCUMENT ADDRESSES THE APPLICATION AND USE OF LEARNING PROPOSED BY THE ARKANSAS CURRICULUM FRAMEWORKS

STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___1. **The student will communicate an understanding of the properties of numbers and operations (add, subtract, multiply, divide).**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Demonstrate number sense (concepts of counting, grouping, and place value) using manipulatives.**	**Students will construct sets to represent numbers using manipulatives.** **Students will count forward from 1-31 and backward from 10 by 1's through one to one correspondence.** **Students will count from 1 to 10 by twos; and to 50 by fives and tens.**	**Students will write numerical symbols related to sets which are represented using manipulatives.** **Students will count forward from 0-100 by ones, twos, fives, and tens.** **Students will demonstrate place value by identifying ones, tens, and hundreds.**	**Students will write numerical symbols related to sets represented by pictures of manipulatives.** **Students will count forward to 1,000 and will count forward and back by 2's, 3's, 5's, and 10's from any given number.** **Students will demonstrate the patterning of place value.**	**Students will construct items to represent place value using manipulatives.** **Students will develop the concept of place value up to hundred thousands.**	**Students will write numerical symbols to represent fractions presented with manipulatives.** **Students will demonstrate the concept of place value up to hundred millions.**

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STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS** CONTENT STANDARD 1

STUDENT LEARNING EXPECTATION _2_ **Develop meaning for the operations (e.g., add, subtract, multiply, and divide) by modeling and discussing a variety of problem situations.**	**Students will use manipulatives to add and subtract to ten, and will orally give an example of a problem situation involving basic addition and subtraction.**	**Students will discuss and model (concretely, pictorially, and symbolically) problem situations involving basic addition to sums of 18 and basic subtraction (takeaway, counting on/missing addend, comparison).**	**Students will discuss and model (concretely, pictorially, and symbolically) problem situations involving 2-digit addition with and without carrying and 2-digit subtraction with and without regrouping.**	**Students will discuss and model (concretely, pictorially, and symbolically) problem situations involving: 3- or more digit addition and subtraction; basic multiplication to 10 (repeated addition, array/area, combinations/ Cartesian products) and division to 10 (measurement, partitioning); multiplication of a multi-digit number by a single-digit number with and without regrouping; and dividing a multi-digit number by single-digit number with and without a remainder.**	**Students will discuss and model (concretely, pictorially, symbolically) problem situations involving 2- and 3-digit multiplication and long division with dividends up to four digits and divisors of one and two digits.**

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STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___1. **The student will communicate an understanding of the properties of numbers and operations (add, subtract, multiply, divide).**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Apply and master counting, grouping, place value, and estimation.**	**Students will apply and master counting forward from 1-31 and backward from 10 by 1's through one to one correspondence.** **Students will apply and master counting from 1 to 10 by twos; and to 50 by fives and tens.** **Students will estimate the number of objects in a set of less than 50 items.**	**Students will apply and master counting forward from 0-100 by ones, twos, fives and tens.** **Students will apply and master place value in the ones, tens, and hundreds places.** **Students will estimate the number of objects in a set of less than 100 items using various strategies.**	**Students will apply and master counting forward to 1,000 and will apply and master counting forward and back by 2's, 3's, 5's, and 10's from any given number.** **Students will apply and master the patterning of place value.** **Students will estimate to the nearest tens and hundreds using rounding strategies.**	**Students will apply and master the concept of place value up to hundred thousands.** **Students will estimate to the nearest tens, hundreds, and thousands using rounding and truncating strategies.**	**Students will apply and master the concept of place value up to hundred millions.** **Students will estimate to the nearest tens, hundreds, thousands, and millions using rounding and truncating strategies.**

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STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___1. **The student will communicate an understanding of the properties of numbers and operations (add, subtract, multiply, divide).**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _4_ **Solve problems using terminology and symbols of operations (e.g., add, subtract, multiply, and divide).**	**Students will learn the meaning of the operations (addition and subtraction), will determine the operation (addition or subtraction) of a problem solving situation, and will communicate the determined operation orally.**	**Students will concretely, pictorially, and symbolically represent problem solving situations involving basic addition and subtraction.**	**Students will relate mathematical terminology and symbols of operations involving addition and subtraction (add, subtract, +, -, =, equal, sum, addend, subtrahend, minuend, and difference) to problem solving situations.**	**Students will concretely, pictorially, and symbolically represent problem solving situations involving basic multiplication and division and will relate mathematical terminology (sum, difference, dividend, divisor, quotient, etc.) to said problem solving situations.**	**Students will relate mathematical terminology and symbols of operations involving multiplication and division (factor, quotient, divisor, dividend, product, multiple, common multiple, common factor, etc.) to problem solving situations.**

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STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___1. **The student will communicate an understanding of the properties of numbers and operations (add, subtract, multiply, divide).**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _5_ **Demonstrate competency of operations (e.g. add, subtract, multiply, and divide) using mental math and technology.**	**Students will demonstrate the concept of addition and subtraction with technology.**	**Students will demonstrate competency with basic addition and subtraction facts (to sums of 18) using mental math and technology.**	**Students will demonstrate competency with addition and subtraction using mental math and technology.**	**Students will demonstrate competency with basic multiplication and division facts (1's - 10's) using mental math and technology.**	**Students will demonstrate competency with multiplication and division using mental math and technology.**

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STRAND: 1 NUMBER SENSE, PROPERTIES, AND OPERATIONS			CONTENT STANDARD 1		
STUDENT LEARNING EXPECTATION _6_ **Use manipulatives to demonstrate and compare rational numbers/fractions (e.g., find simple parts of a whole).**	**Students will use manipulatives to demonstrate the concept of the fraction ½ as one of two equal parts of a region or object, and will find ½ of a set with an even number of concrete objects.**	**Students will concretely, pictorially, and symbolically demonstrate and compare fractions as part of a whole using the fractions 1/2, 1/3, and 1/4.**	**Students will concretely, pictorially, and symbolically demonstrate and compare fractions as a part of a whole using the fractions 1/2, 1/3, 1/4, 1/5, 1/6, 1/8, and 1/10.**	**Students will concretely, pictorially, and symbolically demonstrate and compare fractions (identify the numerator and denominator; write mixed numbers; recognize equivalent fractions; compare fractions with like denominators).**	**Students will concretely, pictorially, and symbolically demonstrate and compare fractions (n/n = 1; write mixed numbers; change improper fractions to mixed numbers; write fractions in lowest terms; rename fractions with unlike denominators to fractions with common denominators; write decimals as fractions; perform basic operations with decimals).**

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STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___1. **The student will communicate an understanding of the properties of numbers and operations (add, subtract, multiply, divide).**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _7_ **Communicate understanding of number sense, properties, and operations through journal writing, creating problems, constructing mathematical sentences, etc.**	**Students will concretely, pictorially, and orally demonstrate number sense (one to one correspondence, skip counting, grouping, etc.).**	**Students will communicate understanding of number sense, properties, and basic addition and subtraction through journal writing, creating problems, constructing mathematical sentences, etc.**	**Students will communicate understanding of number sense, properties, and addition and subtraction through journal writing, creating problems, constructing mathematical sentences, etc.**	**Students will communicate understanding of number sense, properties, and basic multiplication and division through journal writing, creating problems, constructing mathematical sentences, etc.**	**Students will communicate understanding of number sense, properties, and multiplication and division through journal writing, creating problems, constructing mathematical sentences, etc.**

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STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___2. **The student will demonstrate and apply knowledge of numbers and numerical relationships to real-world situations.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Represent numbers and operations (add, subtract, multiply, and divide) in a variety of forms using manipulatives, symbols, and graphs (pictographs, etc.).**	**Students will represent numbers and operations (addition and subtraction to ten) in a variety of forms using manipulatives and graphs.**	**Students will represent numbers and basic addition and subtraction (to sums of 18) in a variety of forms using manipulatives, symbols, and graphs.**	**Students will represent numbers and 2-digit addition with and without carrying and 2-digit subtraction with and without regrouping in a variety of forms using manipulatives, symbols, and graphs.**	**Students will represent numbers, 2- and 3-digit addition with carrying, 2- and 3-digit subtraction with regrouping, and basic multiplication and division through 10's in a variety of forms using manipulatives, symbols, and graphs.**	**Students will represent numbers, multiplication, and division in a variety of forms using manipulatives, symbols, and graphs.**
STUDENT LEARNING EXPECTATION _2_ **Apply elementary number theory (skip counting, patterns, number series, odd and even numbers, multiples, fractions, etc.).**	**Students will apply elementary number theory (skip counting, patterns, sets, etc.).**	**Students will apply elementary number theory (skip counting, patterns, number series, dozen, half dozen, pair, etc.).**	**Students will apply elementary number theory (skip counting, patterns, number series, odd and even numbers, ordinal numbers, rounding to the nearest ten and hundred, etc.).**	**Students will apply elementary number theory (skip counting, patterns, number series, odd and even numbers, multiples, Roman numerals from 1-20, rounding to the nearest ten and hundred, thousands, etc.).**	**Students will apply elementary number theory (skip counting, patterns, number series, odd and even numbers, multiples, fractions, Roman numerals 1-1000, rounding to the nearest ten, hundred, thousand, millions, and cent, etc.).**

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STRAND: 1 **NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___2. **The student will demonstrate and apply knowledge of numbers and numerical relationships to real-world situations.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Apply computation (add, subtract, multiply, and divide) and estimation to real-world problems.**	**Students will apply estimation to real-world problems.**	**Students will apply basic addition, basic subtraction (variety of meanings), and estimation to real-world problems.**	**Students will apply addition, subtraction (variety of meanings), and estimation to real-world problems.**	**Students will apply basic multiplication (variety of meanings), basic division (variety of meanings), and estimation to real-world problems.**	**Students will apply multiplication (variety of meanings), division (variety of meanings), and estimation to real-world problems.**
STUDENT LEARNING EXPECTATION _4_ **Use mental math, manipulatives, and technology to solve problems.**	**Students will use manipulatives to solve problems.**	**Students will use mental math, manipulatives, and technology to solve basic addition and basic subtraction (variety of meanings) problems.**	**Students will use mental math, manipulatives, and technology to solve 2-digit addition problems (with and without carrying) and 2-digit subtraction problems (with and without regrouping) (variety of meanings).**	**Students will use mental math, manipulatives, and technology to solve basic multiplication (variety of meanings) and division (variety of meanings) problems, 2- and 3-digit addition problems (with carrying), and 2-and 3-digit subtraction (variety of meanings) problems (with regrouping).**	**Students will use mental math, manipulatives, and technology to solve multiplication (variety of meanings) and division (variety of meanings) problems.**

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STRAND: **1 NUMBER SENSE, PROPERTIES, AND OPERATIONS**

CONTENT STANDARD ___2. **The student will demonstrate and apply knowledge of numbers and numerical relationships to real-world situations.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _5_ **Describe and compare quantities by using concrete and real-world models of fractions.**	**Students will describe and compare quantities by using concrete and real-world models of the fraction ½ and a whole.**	**Students will describe and compare quantities by using concrete and real-world models of the fractions 1/2, 1/3, and 1/4.**	**Students will describe and compare quantities by using concrete and real-world models of the fractions 1/2, 1/3, 1/4, 1/5, 1/6, 1/8, and 1/10.**	**Students will describe quantities by using concrete and real-world models of fractions and will compare concrete and real-world models of fractions with like denominators.**	**Students will describe and compare quantities by using concrete and real-world models of fractions.**

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STRAND: **2 GEOMETRY AND SPATIAL SENSE**

CONTENT STANDARD __1. **The student will demonstrate, construct, communicate, and apply the properties of geometric shapes and spatial sense to connect geometry with problem solving situations..**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Sort, classify, and construct geometric shapes/figures and objects using a variety of manipulatives.**	**Students will sort geometric shapes/figures and objects using a variety of manipulatives.**	**Students will sort and classify geometric shapes/figures using a variety of manipulatives.**	**Students will classify and construct geometric shapes/ figures using variety of manipulatives.**	**Students will classify shapes/figures in terms of geometric relationships.** **Students will construct two-dimensional geometric shapes using a variety of manipulatives and will sort and classify three-dimensional shapes.** **Students will develop the concept of faces, edges, and vertices of geometric solids.**	**Students will construct three-dimensional shapes using a variety of manipulatives.** **Students will demonstrate the concept of faces, edges, and vertices of geometric solids and will identify the radius and diameter of a circle.**

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STRAND: 2 GEOMETRY AND SPATIAL SENSE

CONTENT STANDARD __1. **The student will demonstrate, construct, communicate, and apply the properties of geometric shapes and spatial sense to connect geometry with problem solving situations..**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _2_ **Describe, model, draw, construct, compare and classify shapes in one, two, and three dimensions.**	**Students will construct, model, and compare shapes in two dimensions.** **Students will describe three-dimensional shapes using two-dimensional shapes (squares, triangles, circles, etc.)** **Students will identify lines in the real world.**	**Students will describe shapes in one dimension.** **Students will construct, model, draw, and compare shapes in two dimensions.** **Students will describe, model, and construct shapes in three dimensions.**	**Students will describe, draw, compare and classify shapes in two dimensions.** **Students will identify lines as horizontal, vertical, perpendicular, parallel and will name lines and line segments using two points .**	**Students will compare and classify shapes in one dimension.** **Students will compare and classify shapes in two and three dimensions.**	**Students will describe, classify, construct, model, and compare geometric shapes in one (points, segments, rays, lines, angles), two (polygons and circles), and three (cones, pyramids, cubes, etc.) dimensions.**

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STRAND: **2 GEOMETRY AND SPATIAL SENSE**

CONTENT STANDARD __1. **The student will demonstrate, construct, communicate, and apply the properties of geometric shapes and spatial sense to connect geometry with problem solving situations..**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Determine the relationship between shapes/figures using congruence and similarity, and using transformations (flips, slides, and rotations).**	**Students will develop the concept of likenesses and differences with regular and irregular shapes.** **Students will manipulate familiar objects through slides, flips, and turns.**	**Students will determine similar and congruent figures.** **Students will experience slides, flips, and turns with two- and three-dimensional geometric objects.**	**Students will determine and draw similar and congruent figures.** **Students will trace and construct slides, flips, and turns.**	**Students will classify figures in terms of similar and congruent.** **Students will predict results of slides, flips, and turns.**	**Students will create similar and congruent shapes.** **Students will recognize the slides, flips, and turns they have made.**
STUDENT LEARNING EXPECTATION _4_ **Predict and determine the results of combining, dividing, and subdividing shapes/figures.**	**Students will combine shapes/figures.**	**Students will predict the results of combining shapes/figures.**	**Students will predict the results of combining and dividing shapes/figures.**	**Students will predict and determine the results of combining and dividing shapes/figures.**	**Students will predict and determine the results of combining, dividing, and subdividing shape/figures to form a new shape.**

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STRAND: 2 **GEOMETRY AND SPATIAL SENSE**

CONTENT STANDARD __1. **The student will demonstrate, construct, communicate, and apply the properties of geometric shapes and spatial sense to connect geometry with problem solving situations..**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _5_ **Demonstrate spatial awareness (positional relationship, size, direction, area, volume, etc.).**	**Students will demonstrate spatial awareness (positional relationship such as closed/open, over/under, above/below, right/left, top/bottom, size, etc.).**	**Students will demonstrate spatial awareness (positional relationship, size, direction, area, etc.).**	**Students will demonstrate spatial awareness (positional relationship, size, direction, area, etc.).**	**Students will demonstrate spatial awareness (positional relationship, size, direction, area, volume, etc.).**	**Students will demonstrate spatial awareness (positional relationship, size, direction, area, volume, diameter, etc.).**
STUDENT LEARNING EXPECTATION _6_ **Use manipulatives and technology to demonstrate geometric concepts (positional relationship, size, direction, area, volume, etc.).**	**Students will use manipulatives to demonstrate geometric concepts (positional relationship, size, etc.).**	**Students will use manipulatives to demonstrate geometric concepts (positional relationship, size, direction, etc.).**	**Students will use manipulatives to demonstrate geometric concepts (positional relationship, size, direction, area, etc.).**	**Students will use manipulatives and technology to demonstrate geometric concepts (positional relationship, size, direction, area, volume, etc.).**	**Students will use manipulatives and technology to demonstrate geometric concepts (positional relationship, size, direction, area, volume, distance, etc.).**

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STRAND: 2 **GEOMETRY AND SPATIAL SENSE**

CONTENT STANDARD __1. **The student will demonstrate, construct, communicate, and apply the properties of geometric shapes and spatial sense to connect geometry with problem solving situations..**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _7_ **Demonstrate geometric and spatial sense through written and oral communication (e.g., draw and describe a color cube model using isometric dot paper).**	**Students will orally describe three-dimensional objects in terms of two-dimensional shapes.**	**Students will, through written and oral communication, describe three-dimensional objects in terms of two-dimensional shapes.**	**Students will demonstrate geometric and spatial sense of two- and three-dimensional objects through written and oral communication.**	**Students will demonstrate geometric and spatial sense by drawing a two-dimensional representation of a three-dimensional object.**	**Students will demonstrate geometric and spatial sense through pictorial, oral and written communication.**

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STRAND: 2 GEOMETRY AND SPATIAL SENSE

CONTENT STANDARD _2_. **The student will solve problems that connect geometric applications to other topics in mathematics and other fields.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Estimate and measure the size of geometric figures/shapes in the real world (length, width, perimeter, area, volume, etc.).**	**Students will develop the concept of the size (length and width) of geometric figures/shapes in the real world using non-standard units.**	**Students will measure the size (length and width) of geometric figures/shapes in real world using non-standard units and standard units (inches, feet, and centimeters) .**	**Students will estimate and measure the size (length, width, perimeter) of geometric figures/shapes in the real world using standard and non-standard units (inches, feet, centimeters, ½ inches).**	**Students will estimate and measure the size of geometric figures/shapes in real world using standard units (length, width, perimeter, area, volume, etc.).**	**Students will estimate and measure the size of geometric figures/shapes in the real world using standard units (length, perimeter, width, area, volume, etc.).**
STUDENT LEARNING EXPECTATION _2_ **Construct and explain geometric patterns using concrete and pictorial models with one or more attributes (color, shape, size, etc.).**	**Students will replicate and explain geometric patterns using concrete models, with one attribute.**	**Students will construct and explain geometric patterns using concrete and pictorial models, with one attribute.**	**Students will replicate and explain geometric patterns using concrete and pictorial models, with two attributes.**	**Students will construct and explain geometric patterns using concrete and pictorial models, with two attributes.**	**Students will replicate, construct and explain geometric patterns using concrete and pictorial models, with three or more attributes.**

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STRAND: 2 GEOMETRY AND SPATIAL SENSE

CONTENT STANDARD ___2. **The student will solve problems that connect geometric applications to other topics in mathematics and other fields.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Use manipulatives and technology to solve problems involving perimeter, area, volume, etc.**	**Students will use manipulatives to solve problems involving perimeter and area.**	**Students will use manipulatives to solve problems involving perimeter, area, and volume.**	**Students will use manipulatives and technology to solve problems involving perimeter and area.**	**Students will use manipulatives and technology to solve problems (perimeter, area, volume).**	**Students will use manipulatives and technology to solve problems (perimeter, area, volume, etc.)**
STUDENT LEARNING EXPECTATION _4_ **Illustrate geometric concepts through written and oral communication. (For example, "I am a rectangular house. My windows are squares. My door is a rectangle. My roof is a triangle.")**	**Students will orally describe three-dimensional objects in terms of two-dimensional shapes as represented in real life.**	**Students will, through written and oral communication, describe three-dimensional objects in terms of two-dimensional shapes as represented in real life.**	**Students will demonstrate geometric and spatial sense of two- and three-dimensional objects through written and oral communication as represented in real life.**	**Students will demonstrate geometric and spatial sense by drawing a two-dimensional representation of a three-dimensional object as represented in real life.**	**Students will demonstrate geometric and spatial sense through pictorial, oral and written communication as represented in real life.**

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STRAND: 3 **MEASUREMENT**

CONTENT STANDARD ___1. **The student will use measurement attributes (length, capacity, weight, mass, area, volume, time, money, temperature, scale, and angle) to describe and compare mathematical and real-world objects.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Demonstrate and apply the concept of comparison (large, small, long, short, etc.) according to given attributes (length, capacity, weight, mass, etc.).**	**Students will demonstrate the concept of comparison (more/less, larger/smaller, shorter/longer, heavier/lighter, etc.) according to a given attribute (shape, size, etc.).**	**Students will demonstrate and apply the concept of comparison (longer/shorter, wider/thinner, hotter/colder, heavier/lighter, etc.) according to attributes (size, shape, weight, etc.).**	**Students will demonstrate and apply the concept of comparison in time (which takes longer), money (which is more), temperature (what is the hottest), and weight (which is heavier) according to attributes (shape, size, purpose, textures, etc.).**	**Students will demonstrate and apply the concept of comparison (longer, shorter, holds more, covers more space, farther around, cost more) according to attributes (color, shape, size, purpose, texture, weight, temperature, etc.)**	**Students will demonstrate and apply the concept of comparison (thicker, at a greater angle, longer period of time, cheaper) according to given attributes.**

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STRAND: 3 MEASUREMENT

CONTENT STANDARD ___1 **The student will use measurement attributes (length, capacity, weight, mass, area, volume, time, money, temperature, scale, and angle) to describe and compare mathematical and real-world objects.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _2_ **Select, demonstrate, and defend the use of appropriate units of measure.**	**Students will select, demonstrate, and defend the use of appropriate units of measure for length (non-standard units).**	**Students will demonstrate the use of appropriate units of measure for time (day, week, month, year, hour, half hour), length (inches, feet, centimeters), capacity (cups, quarts, gallons), temperature and money (cents and dollars).**	**Students will select and use the appropriate units of measure for temperature (degrees), money (bills and coins), length (inches, feet, centimeters, ½ inch), capacity (cups, pints, quarts, gallon) and time (15-minute intervals, a.m., p.m., noon, midnight).**	**Students will select, demonstrate, and defend the use of appropriate units of measure for length (inches, feet, meter, centimeters, yards, 1/4 inch), capacity (liters, etc.), area (square inches, square feet, square meters, square centimeters, square yards), and time (5-minute intervals and hours).**	**Students will select, demonstrate, and defend the use of appropriate units of measure for length (1/2 miles, inches, feet, yards, miles, meters, centimeters, millimeters), time (seconds), capacity (cup, fluid ounces, pint, quart, gallon, liter, etc.), area (square units), volume (cubic units), and weight (pounds, tons, ounces, grams, etc.).**

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STRAND: 3 **MEASUREMENT**

CONTENT STANDARD ___1. **The student will use measurement attributes (length, capacity, weight, mass, area, volume, time, money, temperature, scale, and angle) to describe and compare mathematical and real-world objects.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Convert from one measurement to another within the same system (feet to yards, centimeters to meters, etc.).**	**N/A**	**Students will convert from one unit of measurement to another in coins (pennies, nickels, and dimes) and time (7 days = 1 week, 12 months = 1 year).**	**Students will convert from one unit of measurement to another in length (12 inches = 1 foot), money (all coins and one-dollar bill and five-dollar bill), and time (average month = 30 days; 365 days = 1 year; 24 hours = 1 day).**	**Students will convert from one unit of measurement to anot*.er in money (all coins and bills), time (60 minutes = 1 hour), and linear measure (12 inches = 1 foot; 100 centimeters = 1 meter; 1 yard = 36 inches; 1 yard = 3 feet).**	**Students will convert form one unit of measurement to another using the attached equivalences.**

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STRAND: 3 **MEASUREMENT**

CONTENT STANDARD ___2. **The student will demonstrate the appropriate use of measuring instruments.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Select and use appropriate standard (inches, feet), non-standard (paper clip, thumbnail), and metric (centimeter, meter) measuring instruments (e.g., rulers, scales, measuring tape, yard stick, meter stick, thermometer, etc.).**	**Students will use a variety of objects to measure length, weight, and capacity.**	**Students will select and use appropriate non-standard and standard measuring instruments to measure length, weight, capacity time, and temperature.**	**Students will use appropriate standard and non-standard measuring instruments (ruler for length; scales for weight; clock for time; thermometer for temperature; measuring cups or beakers for capacity).**	**Students will use appropriate standard and metric measuring instruments (thermometer for temperature, ruler for length or width, etc.).**	**Students will select and use appropriate standard and metric measuring instruments (meter stick for length; balance/scale for mass; protractor for angles).**

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STRAND: 3 MEASUREMENT

CONTENT STANDARD ___3. **The student will apply measurement concepts to solve problems inside and outside the field of mathematics.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Estimate and measure quantities such as weight, length, area, volume, money, time, and temperature.**	**Students will estimate and measure in non-standard units area, weight, length, and capacity.** **Students will identify individual coins and one-dollar bill and identify the dollar sign ($) and cent sign.**	**Students will estimate and measure quantities such as weight, length, time, temperature, and capacity in standard and non-standard units.** **Students will recognize the relative value of a penny, nickel, dime, and quarter and will show how different combinations can have the same value.**	**Students will estimate and measure quantities in non-standard and standard units (inches, pounds, degrees, hours, feet, centimeters, cups, pints, quarts, gallons).**	**Students will measure quantities in standard units (inches, feet, meters, yards, centimeters, meters, hours, minutes, cups, pints, quarts, gallons, liters).**	**Students will estimate and measure quantities in standard units (Fahrenheit, Celsius, degrees, grams, pounds, etc.).**
STUDENT LEARNING EXPECTATION _2_ **Solve problems using measuring instruments and technology.**	**Students will discuss and solve problems using non-standard measuring instruments.**	**Students will solve problems using standard and non-standard measuring instruments.**	**Students will solve problems using standard and non-standard measuring instruments (ruler, scale, clock, etc.).**	**Students will solve problems using standard measuring instruments (thermometer, etc.).**	**Students will solve problems using standard measuring instruments and technology (meter stick, balance/scale, protractor, computer, calculator, etc.).**

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STRAND: 3 **MEASUREMENT**

CONTENT STANDARD __3. **The student will apply measurement concepts to solve problems inside and outside the field of mathematics.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Pose problems using customary (inches, feet, etc.), non-standard (paper clip, thumbnail, etc.), and metric measurements (centimeters, meters, etc.) in real-world situations.**	**Students will orally pose problems using non-standard measurements in real-world situations.**	**Students will orally and in written form pose problems using non-standard measurements in real-world situations.**	**Students will orally and in written form pose problems using non-standard and standard measurements in real-world situations.**	**Students will in written form pose problems using standard measurements in real-world situations.**	**Students will in written form pose problems using standard and metric measurements in real-world situations.**

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STRAND: 4 **DATA ANALYSIS, STATISTICS AND PROBABILITY**

CONTENT STANDARD ___1. **The student will perform the steps that comprise data analysis, from gathering information to communicate results.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Utilize the scientific method for data analysis.** A. **Identify the purpose (problem statement) for data collection.** B. **Make a prediction about the final results of data collected.** C. **Collect and organize data (tables, graphs, etc.).** D. **Analyze and interpret data (prediction, inference, conclusion, etc.).** E. **Display data using appropriate bar graphs, line graphs, tables, pie graphs, etc., with and without technology.**	**Students will identify the purpose (problem statement) for data collection (likenesses, differences, most, least, etc.).** **Students will make a prediction about the final results of data collection (alike, different, more, etc.) and analyze the data (biggest, smallest, least, most, etc.).** **Students will collect, organize, and display (both physically and pictorially) data in a variety of formats including bar graphs, Venn diagrams, etc.**	**Students will identify the purpose (problem statement) for data collection (most often, most likely, etc.).** **Students will make, record, and analyze predictions about the final results of data collection (more/most often, more/most likely, etc.).** **Students will collect (tally marks, checklist, etc.), organize and display (pictographs, bar graphs, Venn diagrams, etc.) data in a variety of formats (physically, pictorially, and with written symbols).**	**Students will identify the purpose (problem statement) for data collection (organization, etc.).** **Students will make, record, and analyze predictions about the final results of data collection (occurred sooner, later, etc.).** **Students will collect, organize and display (line plots, bar graphs, etc.) data in a variety of formats (physically, pictorially, and with written symbols).**	**Students will identify the purpose (problem statement) for data collection (which is best, etc.).** **Students will make, record, and analyze predictions about the final results of data collection (best, worst, etc.).** **Students will collect, organize and display (bar graphs, line graphs, circle graphs, etc.) data in a variety of formats (physically and pictorially).**	**Students will identify the purpose (problem statement) for data collection (find a pattern, etc.).** **Students will analyze, interpret, pose new questions, and test predictions about the final results of data collection (the pattern will be/was, what will happen next/what happened next was. etc.).** **Students will collect, organize and display (bar graphs, line graphs, circle graphs, stem and leaf plots, etc.) data in a variety of interdisciplinary sources.**

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STRAND 4 **DATA ANALYSIS, STATISTICS AND PROBABILITY**

CONTENT STANDARD __1_ **The student will perform the steps that comprise data analysis, from gathering information to communicate results.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _2_ **Explain the results of data collection using oral and written communication.**	**Students will orally explain the results of data collection.**	**Students will orally and pictorially explain the results of data collection.**	**Students will orally, pictorially, and in written format explain the results of data collection.**	**Students will orally, pictorially, and in written format explain the results of data collection.**	**Students will orally, pictorially, and in written format explain the results of data collection.**

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STRAND: 4 **DATA ANALYSIS, STATISTICS AND PROBABILITY**

CONTENT STANDARD ___2. **The student will use probability models to perform experiments and simulations.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Predict the results of data collection and demonstrate the concept of chance through the use of manipulatives. (For example: What is the probability of drawing one red marble from a bag of multicolored marbles?)**	**NA**	**Students will make and record predictions based on data and develop the concept of chance with manipulatives.**	**Students will make predictions and demonstrate the concept of chance through the use of manipulatives.**	**Students will use the language of probability (occur most often, likely, etc.) to make predictions based on data from an application of the concept of chance.**	**Students will apply the concept of chance using manipulatives.**
STUDENT LEARNING EXPECTATION _2_ **Record the results of data collection with a variety of formats that could include charts, graphs, tables, and technology, using oral and/or written communication.**	**Students will record the results of data collection with a variety of symbolic formats including bar graphs, Venn diagrams, etc. using oral communication.**	**Students will record the results of data collection with a variety of symbolic formats including check lists, tally marks, bar graphs, Venn diagrams, etc. using oral and written communication.**	**Students will record the results of data collection with a variety of symbolic formats including line plots, stem and leaf plots, and circle graphs using oral and written communication.**	**Students will record the results of data collection with a variety of symbolic formats including pictograph using oral and written communication.**	**Students will record the results of data collection with a variety of symbolic formats including graphs and/or tables using technology, oral and/or written communication.**

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STRAND: 4 **DATA ANALYSIS, STATISTICS AND PROBABILITY**

CONTENT STANDARD ___3. **The student will apply probability and statistical concepts in problem-solving and decision-making situations.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Predict results, analyze data, and find out why some results are more likely, less likely, or equally likely.**	NA	**Students will predict results as being more likely, less likely, or equally likely.**	**Students will predict results and analyze data to be more likely, less likely, or equally likely.**	**Students will predict results, analyze data, and find out why some results are more likely, less likely, or equally likely.**	**Students will predict, analyze, and determine the likeliness of an outcome.**
STUDENT LEARNING EXPECTATION _2_ **Make a true statement based on a simple concept of average (median, mean, mode, and range) for a small sample size.**	**Students will orally make a true statement based on the simple concepts of mode (occurs most often) and range (the smallest and largest).**	**Students will orally make a true statement based on the simple concepts of mode (occurs most often), median (middle number in an ordered series), and range (difference in smallest and largest).**	**Students will, in written form, make a true statement based on the simple concepts of mode, median, and range.**	**Students will , in written form, make a true statement based on the simple concepts of mode, median, range, and mean (average). (e.g. Find the mode, median, range, and mean of 1,1,2,2,4)**	**Students will, in written form, make a true statement based on the concepts of mode, median, range, and mean.**

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STRAND: 4 **DATA ANALYSIS, STATISTICS AND PROBABILITY**

CONTENT STANDARD ___3. **The student will apply probability and statistical concepts in problem-solving and decision-making situations.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Use the tools of technology to assist in gathering, organizing, and presenting information.**	**Students will use the tools of technology to experience gathering, organizing, and presenting information.**	**Students will use the tools of technology to assist in presenting information.**	**Students will use the tools of technology to assist in presenting information.**	**Students will use the tools of technology to assist in organizing and presenting information.**	**Students will use the tools of technology to assist in gathering, organizing, and presenting information.**

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STRAND: **5 PATTERNS, ALGEBRA AND FUNCTION**

CONTENT STANDARD ___1. **The student will use the language/symbols of algebra to represent patterns.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _1_ **Sort and classify a wide variety of materials.**	**Students will sort a wide variety of materials using one attribute (color, shape, size, etc.).**	**Students will sort and classify a wide variety of materials using one attributes (color, size, shape, amount, function, etc.).**	**Students will sort a wide variety of materials using two attributes (color, size, shape, etc.).**	**Students will sort and classify a wide variety of materials using at two attributes.**	**Students will sort and classify a wide variety of materials.**
STUDENT LEARNING EXPECTATION _2_ **Describe, extend, and create a wide variety of patterns using concrete models.**	**Students will describe and extend (through motion, color, sound, position, shape, size, and quantity) repeating and growing patterns.**	**Students will describe and extend a wide variety of patterns from one medium to another including symbolic representation (transfer from concrete to pictorial).**	**Students will describe and extend a wide variety of patterns to symbols using a wide variety of materials (transfer from concrete to symbols).**	**Students will describe, extend, and create a wide variety of patterns using concrete models.**	**Students will describe, extend, and create a wide variety of patterns using a wide variety of materials (transfer from concrete to symbols).**

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STRAND: 5 PATTERNS, ALGEBRA AND FUNCTION

CONTENT STANDARD ___1. The student will use the language/symbols of algebra to represent patterns.	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _3_ **Demonstrate equality (=) and inequality (<, >) using manipulatives and symbols.**	**Students will compare sets represented with manipulatives using the terms greater than, less than, and equal to (no symbols at this level).**	**Students will construct equations and inequalities using manipulatives.** **Students will represent equalities and inequalities pictorially and transfer to symbolic representation using <, >, =.**	**Students will connect manipulative, pictorial, and symbolic representation (in any order) of number sentences using <, >, =.**	**Students will create, analyze, generate, and communicate equations and inequalities using manipulatives, pictures, and symbols.**	**Students will demonstrate equality and inequality using symbols <, >, =.**
STUDENT LEARNING EXPECTATION _4_ **Demonstrate the beginning concept of a variable. (Use boxes, letters, or other symbols to stand for any number or object in simple situations, with or without concrete material, such as 6 + ___ = 8 or 3 + B = 4, etc.).**	**Students will orally furnish an answer for an unknown that will make a true mathematical statement. (e.g., The teacher asks, "What plus three makes four?")**	**Students will orally and symbolically furnish an answer for an unknown that will form a true mathematical statement. (e.g., 6 + ___ = 8)**	**Students will write an answer for an unknown that will form a true mathematical statement. (e.g., ___ - 9 = 7; 7 + ___ = 16; 4 x ___ = 8)**	**Students will use boxes, letters, or other symbols to stand for an unknown that will form a true mathematical statement. (e.g., ___ x 9 = 63; 81 ÷ ___ = 9; (43 - 32) x (5 + 3) = ___)**	**Students will represent variables concretely and symbolically. (e.g., B x 9 = 63; 81 ÷ ___ = 9; (72 ÷ 9) x (144 ÷ 12) = ___)**

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STRAND: 5 **PATTERNS, ALGEBRA AND FUNCTION**

CONTENT STANDARD ___1. **The student will use the language/symbols of algebra to represent patterns.**	KINDERGARTEN	GRADE 1	GRADE 2	GRADE 3	GRADE 4
STUDENT LEARNING EXPECTATION _5_ **Express mathematical relationships in one and two dimensions. (Length x Width = Area, L x W = A, etc.)**	**N/A**	**Students will express mathematical relationships in one and two dimensions (e.g., 7 days = 1 week, 7 days = 1 wk.; 12 months = 1 year, 12 mos. = 1 yr.; etc.).**	**Students will express mathematical relationships in one and two dimensions (e.g., 1 foot = 12 inches, 1 ft. = 12 in.; 24 hours = 1 day, 24 hrs. = 1 day;etc.).**	**Students will express mathematical relationships in one and two dimensions (e.g., 60 minute = 1 hour, 60 min. = 1 hr.; etc.).**	**Students will express mathematical relationships in one and two dimensions (e.g., length x width = area, L x W =A; etc.).**
STUDENT LEARNING EXPECTATION _6_ **Use oral and/or written communication to interpret created patterns.**	**Students will pictorially and orally communicate to interpret created repeating and growing patterns.**	**Students will pictorially and orally communicate to interpret a wide variety of created patterns from one medium to another.**	**Students will pictorially, orally, and in written format communicate to interpret a wide variety of created patterns.**	**Students will pictorially, orally, and in written format communicate to interpret a wide variety of created patterns.**	**Students will pictorially, orally, and in written format communicate to interpret a wide variety of created patterns.**

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